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MSc Construction Economics and Management

Quality in the Apartment Building Industry
A case study in Greece

by

Georgios Anagnostou

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'Dedicated to my father Triantafillos may he rest in peace'

ProQuest LLC
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Abstract

The construction industry has often been accused of providing low quality structures, mainly to increase financial profits. While in most European countries the picture has changed, and quality control and management systems are in place, in Greece, construction suffers from the lack of quality systems, especially in the apartment building industry.

In the first part of the thesis, approaches of quality are reviewed, and their applicability to the construction industry is analysed. Furthermore, quality systems and total quality management in the construction industry are widely examined. The aim is to investigate the main reasons laying behind the poor quality structures in the Greek apartment building industry, and if the available quality control systems are applied, to monitor their contribution in quality of construction.

In the second part, an outline of the Greek apartment building industry is described through a research on quality aspects, from the customers and construction firms' perspective. In addition, new construction techniques, building materials and quality standards are introduced, in order to improve the industry's picture.

Finally, the future prospects of management systems and quality processes are recommended to customers and construction firms.

Key Words: Costruction quality, Housing, Hedonic pricing models,
Design Quality Indicators, Quality Control

Word Count: 10,057

1. Introduction

It is widely accepted that construction activities are intimately related to the economic development of a country. The sophistication of construction further grows as economic development grows in a virtuous circle. There are three variable factors affecting a construction project's success within the industry today: cost, time of completion and quality of construction.

Many countries of Western Europe have given a great example for efficient construction project completion in terms of cost and time, while reaching more than acceptable levels of quality of construction. Unfortunately, in Greece the construction industry could not follow the pace of progress made in West Europe.

The Greek apartment building industry specifically, was characterised by poor quality structures, low aesthetics developments and repulsive contractors' reputation. All the above, in combination with the fact that the Government was serving the contractors' interests, have distorted completely the picture of the apartment building industry in Greece.
However, following the Olympic Games construction projects in Athens, in 2004, great progress was made in the way Greek construction firms perform; projects such as the Olympic Stadium in Athens, the transportation infrastructure and the Olympic Village were completed on time, within budget and the quality of construction had major praise. Therefore, a new era seems to begin for the Greek construction industry. Undoubtedly, there is a lot of room for improvement, and quality of construction should be the key for the challenge faced.

But how quality of construction can be defined? Many believe that quality in construction is achieving zero defects, which is the primary battle ground between traditional and modern construction methods. A relative concept, zero defects is however a target that the construction industry has set for itself. Primary considerations are structural stability and keeping the water out. Proper functioning of services, components, fixtures and fittings are essential. Energy and sound performance are also vital, as well as issues of safety, access and security. This is a campaign which will be fought by the domestic construction firms in Greece, in years to come.

Chapter 2 Literature Review

2.1 Quality in the construction industry

It is a fact that during the last decade a large amount of bibliography and research studies deals with the issue of quality in the construction industry. Moreover, judging from the great growth of bibliography that was developed in a little amount of time, it is obvious that there is serious difficulty in defining the term quality in the construction industry. Thus, the basic motives which lead to the attempt of defining quality in the construction industry are:
- the need for reduction of the production cost in construction projects
- the need for improvement in the safety of construction projects
and generally the creation of a competition which will promote the social prosperity.

According to relative research studies, it appears that in the U.S.A. 15% of the total cost of a construction project is spent to achieve the qualitative requirements and specifications. In addition, in the U.K. 50% of the construction faults are related to incorrect or incomplete planning and 40% of them are made during the construction process (Rahman, 1993). Such data provide a picture for the main elements of quality in construction, which are:
a) Complete and detailed planning and
b) Proper implementation of the construction process

It should be mentioned that it is possible to define the characteristics of the quality for a certain project such as a bridge or a building but there is great difficulty to define quality to the whole entity of construction industry.
That is why quality in construction is separated into two categories:
1) Product Quality
2) Service Quality
The wide range of quality issues affecting the industry, lead to a detailed breakdown of construction procedures, in order to monitor and constantly improve quality.
At this point it is important to define and differentiate the construction product from the construction service.
Construction produces a product. The product is the building or a structure. It is frequently the design of someone else, the architect or engineer. This imposes

constraints upon the contractor for tailoring the product to meet the needs of clients unless it is a turn-key, BOOT or Design & Build contract. While many contractors sub-contract the design out to architects and engineers, in-house design or subcontracting, where the contractor is in control, is the norm in most other industries. It inhibits innovation of the technical and production methods that the contractor adopts. It also inhibits the ability of the contractor to serve the client in an efficient way. Those selling a contractor service are essentially selling the ability to realise the design of someone else. A large part of what is provided by contractors and consultants alike is a service rather than a product. (Smyth, 2000)
The more the contractor makes, the more it is a product and on the other hand, the more the contractor subcontracts, the more it is a service.

Service quality in construction has many of the characteristic of the user based approach of quality. The service is provided according to the customer's needs and is adjusted to the customer's expectations.
In contrast, product quality in construction is based on the product approach of quality, where certain standards and specifications are set, through method statements, construction procedures and quality plans. Product quality appears to be measured and agreed at the pre-construction phase.

Finally, it should be mentioned that due to the nature of the industry, developers do not always know the buyer in advance and that is why there was a need for a quality system which focuses on the company and customers' needs and expectations.

2.2 Design Quality and Value

In 1999 the Construction Industry Council (CIC) set itself the challenging task of trying to produce performance indicators for the design of buildings, to develop a tool that could measure and benchmark the design quality of constructed buildings. Three quality fields where identified: 'Functionality', 'Build Quality' and 'Impact'. However, it is the duality and interplay of each of these three quality fields that together create a high quality building (Spencer and Winch, 2002).
Design quality is hard to quantify as it consists of both objective and subjective components as stated by Gann et al. (2003). The CIC' s task was the starting point of a development process known as Design Quality indicators (DQI).

2.3 Design Quality Indicators in Construction

The most important measure in any evaluation of a building's design is whether it satisfies user requirements and what users think and feel about it. A number of different tools were being used to understand building quality and design. For a detailed review of indicators, see Amin et al. (2000). Notable example amongst these are: i) PROBE (Post-Occupancy Review of Buildings and their Engineering), ii) Housing Quality Indicator and iii) BREEAM (Building Research Establishment Environmental Assessment Method.

The DQI consists of three elements: a conceptual framework, a data gathering tool and a weighting mechanism. As described by Gann et al. (2003), at the core of the DQI tool was a questionnaire that was designed to be used by anybody involved in design or use of buildings, and to be short, simple and clear. A draft of the questionnaire is shown in Figure 1.

Build Quality

For sections N to P please additionally circle the 3 statements within each section that you feel are the most important for your building

N PERFORMANCE	Strongly Disagree	Disagree	Tend to Disagree	Tend to Agree	Agree	Strongly Agree	Not Applicable
01 The building is easy to clean	O	O	O	O	O	O	O
02 The building withstands wear and tear in use	O	O	O	O	O	O	O
03 The building is easily maintained	O	O	O	O	O	O	O
04 The building design has responded to the site microclimate	O	O	O	O	O	O	O
05 The building will weather well	O	O	O	O	O	O	O
06 The building's structure is efficient	O	O	O	O	O	O	O
07 The building's finishes are durable	O	O	O	O	O	O	O
08 There is sufficient daylight in the building	O	O	O	O	O	O	O
09 The artificial lighting levels in the building are sufficient	O	O	O	O	O	O	O
10 The thermal climate in the building is appropriate to its use	O	O	O	O	O	O	O
11 The acoustics quality is appropriate to its use	O	O	O	O	O	O	O
12 The air quality is appropriate to its use	O	O	O	O	O	O	O
13 The building is easy to operate	O	O	O	O	O	O	O
14 The building produces a low number of complaints/faults reported by users	O	O	O	O	O	O	O

Figure 1 : Detail of a draft of the questionnaire

The results produced by the DQI can be compared both between participants and between different construction projects. Architects can compare to that of an engineer, managing agent, constructor, commissioner and so on. Likewise buildings can be compared and contrasted either by sector, by capital value, by procurement route and so on.

Spencer and Winch (2002) state that the DQI is a powerful methodology and when implemented in construction and property industries, has the potential to serve as an effective mechanism for raising the average quality of buildings in the built environment, and enabling a greater understanding of the value of good building design.

Prior to capturing the picture in the Greek apartment building industry it is important to provide a brief of a method to estimate quality attributes and decompose them into measurable price and quantities through the hedonic pricing models.

2.4 Hedonic Pricing Models of Housing

Malpezzi (2002) in his review of the hedonic pricing models, states that at its simplest, an hedonic equation is a regression of expenditures on housing characteristics. The independent variables represent the individual characteristics of the dwellings, and the regression coefficients may be transferred into estimates of the implicit prices of these characteristics. The hedonic regression assumes that we know the determinant of a unit's rent: R=f(S, N, L, C, T), where:

R=rent;(substitute V, value, if estimating hedonic prices indexes for, say, homeowners using sales data);

S= structural characteristics;

N= neighbourhood characteristics;

L= location within the market;

C= contract conditions and

T= the time rent

A full dataset would include the following: rooms, floor area of the unit, structure type, age of unit, type of heating, structural materials, quality of finish, neighbourhood variables, distance to the central business district, access to shopping, schools and possibly racial or ethnic characteristics. It is a fact that over the past three decades, hedonic estimation has matured from a new technology to the standard way economists deal with housing's heterogeneity.

Chapter 3-The picture in the Greek Apartment Building Industry

3.1 Quality in Greece: Past and Present

3.1.1 Importance of quality in Greece in the post-war era

Quality as an issue related to productivity, appeared in many sectors of the national economy, as the country began in the late 1950s a rapid industrialisation process. The presence of American and European companies that started operating in post-war Greece increased consumers' awareness of the superiority of quality of imported products. The same happened in services with the coming of foreign banks and insurance companies. However, progress in improving quality, as a key to increasing competitiveness of the Greek firms themselves, was slow. One key reason was the protection barriers related to high tariffs and custom duties for imports. Another one built in the structure of the country was the large and highly inefficient public sector, accounting for more than 60% of Gross National Product (GNP).

-3.1.2 The effects of joining the European Community

A turning point, in focusing management's attention to productivity and quality while increasing their awareness of them as potential competitive weapons was the country's joining the European Community as an economic entity in 1981. This led to the gradual removal of trade barriers and intensified competition for Greek producers, creating strong pressures for performance improvement in manufacturing and services. In this period we can identify only "islands of quality" in Greek firms. Their superior quality performance was related mainly to charismatic leaders or gifted craftsmen, rather than a systematic effort to manage quality in most productive activities.

3.2 Housing development process in Greece

A significant change has taken place in the housing development process, in Greece following the successful construction projects of the Olympic Games in 2004. The past four years the main housing system known as Antiparohi, has been gradually replaced by Real Estate.

In the Antiparohi system two sorts of contracts exist. The first one include the assignment of the project, building of house, in return with a proportion to the initial ownership, while the second contract determines the simultaneous transfer to the

developer the right of construction on the foreign land in return with a proportion to the final product. [Sofoulis, 1990 & Getimis, 1989]
The above allowed landowners to dominate the housing production system for the past three decades. Lack of governmental regulations and control, led to the construction of apartment blocks lacking of quality, design. Large profits were made by land owners and contractors, underlining a dark era of the industry in Greece. Technical faults and need for repairs characterised the buildings constructed. Antiparohi has been widely criticised as a housing production system and the potential homebuyers are now more demanding. The heritage left by the international construction firms performance on the Olympic projects, raised the level of aesthetics, design and quality, and customers seek for zero defects and value for money when buying a property. It is a new climate, unknown for most of the domestic construction firms.
Quality requirements are still mainly based on past experience by most of the construction firms. There is no doubt that quality is neglected in order to achieve higher profit margins. Construction materials are selected on a cost basis and subcontractors are not expected to provide documented quality assurances. There are no setting bodies such as NHBC in the UK, to insure quality of construction, and the only quality control is performed by the site managers' experience. Departments to monitor quality are now being set within the firms and the author's aim is to research the problem of lack of quality in the Greek housing industry and discover the role of quality in this current climate of change.
It is important to provide the current picture of housing in Greece as described by the data gathered from the Greek bibliography in the following paragraphs.

3.2.1 Housing stock

Housing stock increased by almost 30% over the 1990-2005 period and is expected to further increase by another 14% by 2015. The percentage of new dwellings represented 3% of total housing stock in 1990, but this fell to less than 2% in 2005 and is expected to drop below 1% by 2015.
New builds are mostly blocks of apartments or maisonettes, detached or semi detached. The latest trend in construction of new apartments is that bedrooms tend to be quite small while the living area is more spacious and a continuation of the kitchen. Another recent trend in big urban centres is the construction of apartment blocks that offer additional facilities for the apartment owners, such as swimming

pools, gyms, playrooms and big gardens. However buying an apartment in such constructions is still quite expensive in Greece.
Many Greeks own a second house often situated in a village or small town. This is due to the urbanisation trend, as many people left their home towns to live in the big cities but kept their dwellings back home where their parents may still live. Second homes tend to be smaller, or apartments near the sea or in the mountains for vacation purposes. Usually, village houses are of poorer quality, equipped to fulfil the limited needs one has when on vacation. In terms of furnishing, most people move their old furniture and electrical appliances from their main houses or buy cheap ones to fulfil their needs.

3.2.2 Number of Households by Tenure

The percentage of owned households increased by 14% between 1990-2005 to account for 72% of all households in 2005. Over the same period, rented households grew by 19%. During the last decade there was a significant increase in single-person households that are occupied by young people and are predominantly rented. Other households more than doubled to account for 8% of households in 2005.

Other households include those that are privately owned and occupied by members of the owner's family, without paying a rent, a practice called free allotment of residence. This sometimes happens for tax purposes (where people already own a house and want to buy another, but declare it in the name of another person in the family to avoid paying more tax). Another reason is that some people do not fulfil the criteria to get a mortgage loan, and so the loan is granted to the name of another member of their family fulfilling these criteria. As a result, the house is bought under the name of the loan guarantor, while their relatives occupy the house. We can therefore assume that many households within other are in fact owned households pushing their share up to 80% of total households in 2005.

Greeks are predominantly homeowners, a trend that was boosted in the last 3-4 years by the drop in interest rates on mortgage loans. This gave people with lower incomes the opportunity to buy their own house. There have always been measures helping people acquire their first house. For instance, there are subsidies for first-buyers, the amount of which varies according to the marital status of the candidate,

the number of children, as well as the size and cost of the house. The public Workers Housing Organisation (OEK) provides social housing for workers, loans for beneficiaries to purchase or build their own home as well as loans for beneficiaries to extend, repair or complete an existing house that belongs to them.

% of total households	1990	1995	2000	2003	2004	2005
Home owner	76.23	75.43	73.31	72.37	72.29	72.14
Rented	20.18	21.61	20.22	19.96	19.98	19.96
Other	3.59	2.96	6.47	7.67	7.73	7.90
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Table 1: Number of Households by Tenure (% Analysis)
Source: National Statistical Office, Euromonitor International

3.2.3 Number of Households by Type of Dwelling

Over the 1990-2005 period the number of detached houses in Greece decreased by almost 4%, semi-detached houses increased by 34% and apartments increased by 60%. As a result, in 2005 apartments represented over 30% of total households, up from 23% in1990. Detached houses are still the majority with 40% of total households, but it is expected that in a few years apartments will become the most common type of welling. Already in large urban areas, blocks of apartments constitute the largest part of building activity, due to space and cost limitations. The plots of land available for building in urban areas is not enough to cover the needs of the population, so apartments blocks provide more housing units per square metre. Furthermore, it is more expensive to buy a single house than an apartment of equal surface area.

It is interesting to notice, however, that in the last five years all housing types posted an increase. This could be explained by the fact that interest rates dropped and many people prefer to borrow more money in order to build or buy a detached house, instead of a less expensive apartment.

% of total households	1990	1995	2000	2003	2004	2005
Detached house	49.52	42.79	39.74	39.62	39.58	39.54
Semi-detached house	26.30	29.22	29.51	29.36	29.31	29.26
Apartment	22.88	26.95	29.94	30.23	30.33	30.43
Other	1.30	1.04	0.81	0.79	0.78	0.77
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Table 2: Number of Households by Type of Dwelling (% Analysis)
Source: National Statistical Office, Euromonitor International

3.2.4 Greek Housing Market Current Picture

A slump in Greece's housing market contributed to the contraction of investment in the first quarter of 2008. The volume of new building permits issued in the first quarter of 2008 declined by 21.7% year on year. Housing is estimated to account for about 80% of the total volume of building permits issued. In 2005 there was a sharp increase in the number of permits issued ahead of the imposition of a 19% value added tax (VAT) on newly constructed properties, effective January 1st 2006. The volume of permits issued fell by 19.5% in 2006 and by 5% in 2007. Property taxes were increased by 1% on January 1st 2008 which has contributed to the housing slump this year. Real-estate brokers estimate that there are currently between 300,000 and 400,000 unsold flats on the market in Greece.

3.3 Porter's Five Forces Analysis

In order to accurately examine the current picture of the housing industry in Greece, Porter's five forces analysis is described in the following paragraphs.

3.3.1. Degree of Rivalry

Buyers can improve their existing home to the size and value desired. Demand for housing remains strong due to population growth. Little or no foreign competition exists, even at the national level. There has been a consolidation of the market with mergers and acquisitions with the larger national companies. A lack of available credit has resulted in a fall in demand for new house builders and the finance to develop them. Overall, the degree of rivalry is moderate.

3.3.2. Buyer Power

In order to analysis the homebuilding market, market players will be taken to be construction companies with house buyers as end users. There is a wide variety of market players in the industry from national and regional companies to local small firms and sole proprietors. Economies of scale exist. Houses are differential in design and location strengthening buyer power with the end user. End users are highly price sensitive due to the major expense involved in purchasing, increasing buyer power. Demand is highly influenced by macro-economic factors (interest rates, employment levels, wage rises, the availability of credit) weakening buyer power. Location becomes an important buying influence for end users, reducing choice for consumers and weakening buyer power. Overall, buyer power is moderate.

3.3.3. Supplier Power

The main suppliers in the homebuilding industry are land, finance and building materials. The strongest supplier is land. There is strong demand for land as a scare resource, plus lengthy processes between buying to planning permission, increasing supplier power. Homebuilders require finance on a development by development basis; funds are normally withdrawn during periods of economic downturn, increasing supplier power. Larger firms negotiate down on bulk purchases especially as the trend is towards regional and national procurement, weakening supplier power.

Larger firms can order direct from the manufacturer, further reducing costs and increasing their power. Building material costs rise as global commodity prices also increase, strengthening supplier power. Suppliers are numerous at the local level but concentrated at the national level, weakening supplier power. Overall, supplier power is moderate.

3.3.4. New Entrants

Up front capital costs are not a significant barrier to deter entry at the local domestic level in homebuilding. The use of sub contract labour is done on a local level at the development, levelling out labour costs between the small and larger homebuilder. The technical complexity of homebuilding is moderately low. Barriers to entry are, however, increasing. Regulation is increasing with developments; economies of scale are increasing in both access to finance (to buy land) and building materials procurement. There is a trend for mergers and acquisitions with the market. Large companies enjoy superior, more reliable access to capital (including bank credit and corporate bonds) than smaller companies. A stagnant market in homebuilding deters new entrants into the market. Overall, the likelihood of new entrants is moderate.

3.3.5. Substitutes

Buyers can buy an existing built home or rent. Buyers can improve their existing home to the size and value desired. Demand for housing remains strong due to population growth. Overall, the threat of substitutes is moderate.

3.3.6. Summary

There is a wide variety of market players in the industry from national and regional companies to local small firms and sole proprietors. Economies of scale exist. Demand is highly influenced by macro economics factors (interest rates, employment levels, wages rises, the availability of credit) weakening buyer power. The main suppliers I the homebuilding industry are land, finance and building materials. The strongest supplier is land. The use of sub contract labour is done on a local level at the development, levelling out labour costs between the small and larger homebuilder. The technical complexity of homebuilding is moderately low. Barriers to entry are, however, increasing. A stagnant market in homebuilding deters new entrants into the market. Buyers can buy an existing built home or rent.

Porter's five forces analysis was the basic source of ideas to generate propositions, which could be drafted as questions for the interviews and questionnaires, as described in the following chapters of the author's empirical work.

Chapter 4 – Methods for Research

4.1 Research aims and objectives

The main objective of this field research is to describe the construction quality in the Greek apartment building industry. The achievement of that certain objective, will lead to the determination of the issues that should concern the boards of the construction firms, in order to be more competitive, through the upgrade of the quality, of provided services and output.

The areas that are going to be researched are the following:

- The indicators that evaluate the performance of the enterprises
- The main competitive advantages of the enterprises
- The weaknesses of the enterprises
- The comprehension of the term 'quality'
- The methods of performing quality control
- The opinions regarding the certificates of guarantee of quality (ISO 9000)

The following section outlines the aims and objectives of the author's research.

Aims

- Identify and analyse the main reasons behind the existing poor quality in the Greek apartment building industry.
- Review approaches of quality and analyse the quality management systems available in the construction industry.
- Examine the present picture of the Greek apartment building industry.
- Introduce new quality standards and systems, innovative building techniques and materials.
- Provide recommendations to customers and construction firms to improve quality in the apartment building industry.

Objectives

- Investigate the key variables in the Greek apartment building industry as far as quality issues are concerned.
- Analyse the customers' criteria when buying a new apartment.
- Examine the customers' level of satisfaction and the extend of legal protection when buying a new apartment.
- Review if there are any quality systems applied within the Greek

construction firms quality control process.

- Explore the importance of educational programs and briefing of personnel on quality issues within the construction firms.
- Investigate the main competitive advantages and main weaknesses of Greek construction firms.
- Examine the extend Greek construction firms address quality issues.
- Provide an analysis of the level influence customers achieve to construction firms regarding quality issues.
- Analyse the link between quality and cost from the contractor's perspective.
- Examine and recommend the kind of processes that construction firms could follow and adopt in order to improve quality in the Greek construction industry.

4.2 Methods for research

Generous part of my research generates data from the available literature on construction quality, mainly from the UK and Greek bibliography.
In order to strengthen the accuracy of this report, the author made the decision, following his tutors' advice, to perform a field survey in Greece.
Construction firms and customers were interviewed to capture the pulse in the current apartment building market. Given the nature of the thesis, as part of my MSc studies, a sample of construction firms and a target group of customers was chosen.

Middle size Greek construction firms were chosen (3 to 50 employees and turnover £4m to £10m), operating in the apartment building industry only. Due to the sensitivity of the research subject, five out of seven construction firm representatives agreed to be interviewed by the author.
The sample of the construction firms constitutes three contractors, one consultant and one developer. Moreover, in order to capture a clear domestic picture of the industry two of the firms chosen operate in Athens, one in Thessalonica and two in Larissa, Greece.
The customers sample was determined mainly on an age basis. Professionals between 25-35 years old, constitute the majority of potential buyers of new apartments, in Greece. Furthermore, part of the author's set requirements was the customer to have bought his/her apartment within the past five years.

The main steps of the method chosen were the following:

1) Selection of categories and type of data which need to be collected.
2) Preparation of questions for interviews and questionnaires (Appendix)
3) Defining the criteria of the sample
4) Selection of sample (5 construction firms, 4 customers from each firm)
5) Defining the method of completing the questionnaires
6) Collection of data
7) Analysis of data and outcomes

The main categories and type of data that were to be gathered from this research, were based upon the literature review in the previous chapters, and derived from the Porter's five forces analysis, applied in the Greek apartment building industry.
The aim of the interviews was to gather the following data:

- Indicators that evaluate the performance
- Volume of competition and marketing conditions
- Competitive advantages & Weaknesses
- Influence of governmental regulations
- Policy and objectives regarding quality
    - Understanding of the characteristics of quality
    - Organisation, methodology and characteristics of quality control systems
    - Understanding of the term guarantee of quality
- Sources of information concerning customers demands
- Obstacles and problems in the construction process

The questions prepared for the interviews with the construction firms representatives were a total of 23, concerning i) the structure and organisation of the enterprise, ii) the understanding of quality and quality control issues

The questions for the customers' questionnaires were a total of 11 related to i) repairs and problems occurred to new apartment buildings, ii)criteria in choosing a contractor and an apartment and iii) level of satisfaction in terms of value for money and the future of the apartment building industry.

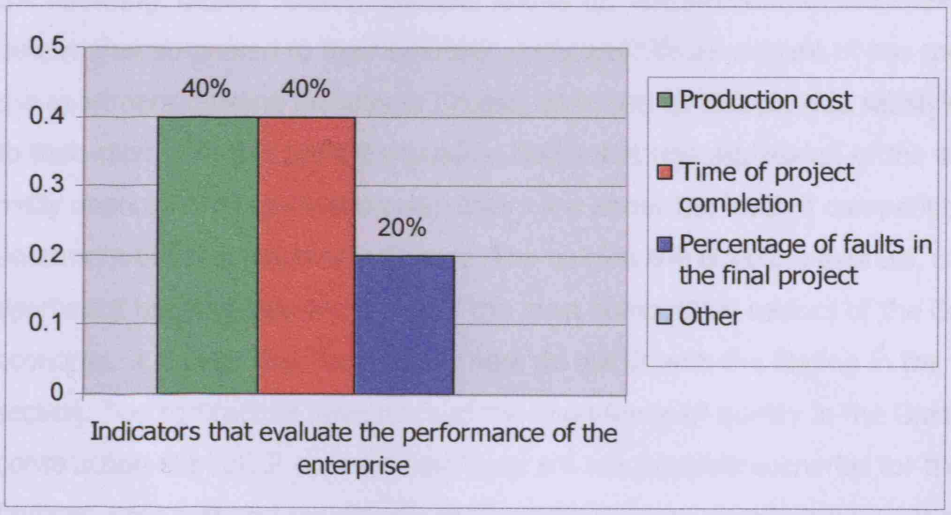
The content of the questions for the interviews and the questionnaires were drafted by the author with the close guidance of his report supervisor.
The aim of the questions for the interviews was to create an open discussion with the firms' representative, directors of quality control mainly, in order to extract as much information as possible, given the sensitivity of the subject researched. The questions were not always asked with the same order, but brought up during the discussion when the right moment occurred. The outcome was to collect answers in almost all of the author's questions.
On the other hand, the questionnaires were not given to the customers by hand or sent by post, the author was explaining the questions and the pre drafted options of answers to the customers while they were filling the questionnaires. The concept of the DQI questionnaire was taken into account when drafting the questions and areas of research.
To sum up, from the author's point of view, a small size sample of representatives was the preferable option than the complete lack of representativeness. The questions asked derived from the literature review mainly by the design quality indicators bibliography and based on the Porter's five forces analysis.

Chapter 5 – Research on Quality in the Greek apartment building industry

5.1 Description of data gathered

Through this chapter the data gathered from the interviews and the questionnaires are presented and analysed. The examination and analysis of the data is achieved through bar charts and pies, followed by comments, in order to be easily perceived by every reviewer. Before the analytical presentation of data it should be mentioned that the employees interviewed at the construction firm were the directors of qualitative control and the majority of customers completing the questionnaires had a higher education background. Moreover, it should be stated that the analysis of the answers given, will be based on homogenous samples regarding the examined subject, and not on each individual question of the interviews/questionnaires.

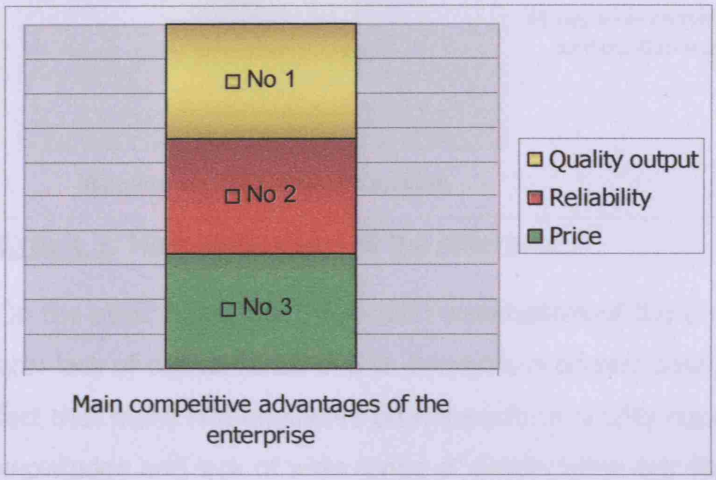
5.1.1 Description of data from interviews at the construction firms



Graph 1: Indicators that evaluate the performance of the enterprises

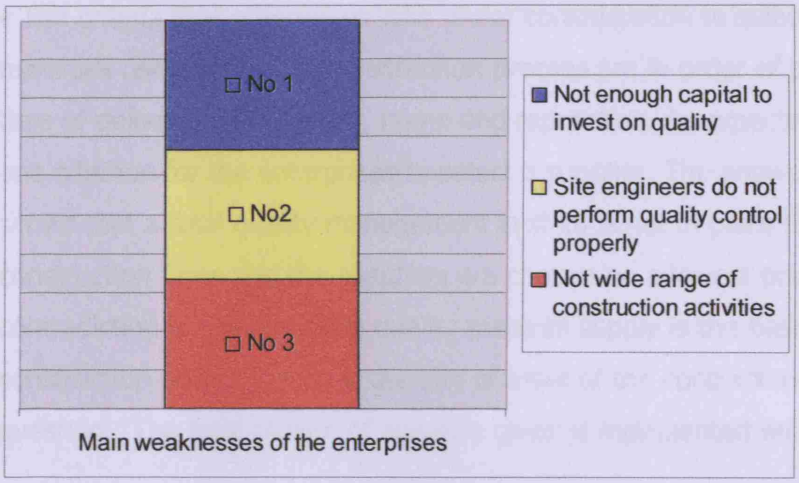
• The main indicators that evaluate the performance of the enterprises are firstly, production cost as well as the time of project completion. It appears that the percentage of faults in the final project, which is related to quality of the final output and the construction process, has less weight as an indicator for the enterprises. It can be said that time and cost, lead to quality being lower and moving towards one

they sacrifice the other. Contractors gave an expected answer since in construction the time-cost-quality triangle involves trade offs. What wasn't mentioned is the time and profit lost when not making it right the first time as introduced by Garvin through the manufacturing approach of quality. The total picture of answers is given on Graph 1.



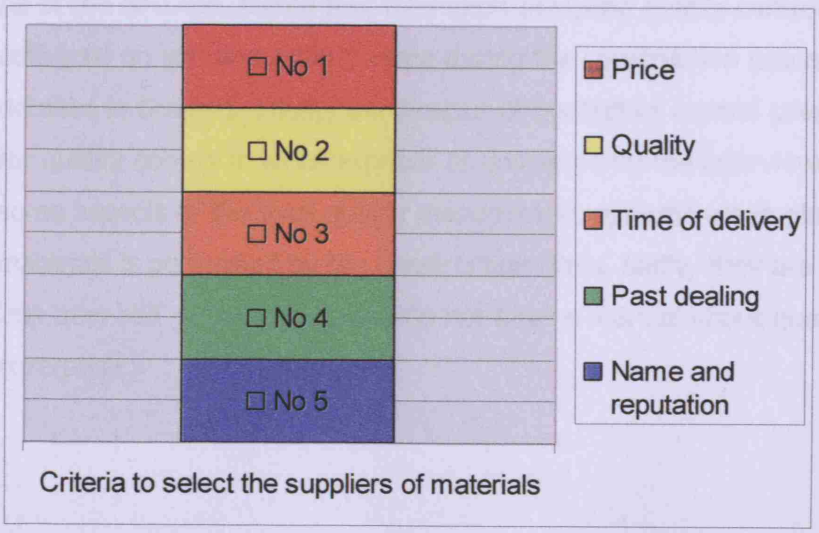
Graph 2: Main competitive advantages of the enterprises

• The three main competitive advantages of the enterprises, in order of priority, are the following: quality output, reliability and price. The directors of the enterprises believe that compared to their domestic rivals and taking account of the specificity of the apartment building industry in Greece, their enterprises provide satisfying quality to their clients. At this point it should be noted that this expression of the directors is really important in combination with their view about the level of competition in the apartment building industry in Greece. The opinion the directors express, is that the apartment building industry is one of the most competitive sectors of the Greek economy. It is clear that the findings here do not fit with the finding in the previous section. The contractors have realised the importance of quality in the Greek construction market. It appears that there are two possible scenarios for the above findings. Low cost and rapidity are given and can be achieved easily, so the company that can achieve the minimum trade off on quality has an advantage. On the other hand an alternative scenario is the fact that an important part of the management is sensitive to quality and know how far to go with a drop in quality, in order to achieve lower cost and speed, and therefore knowing where to stop with the trade offs. The second likelihood is closer to the value and user approach of quality by Garvin and requires a good understanding of the market and the customers' requirements. The competitive advantages are shown in Graph 2.



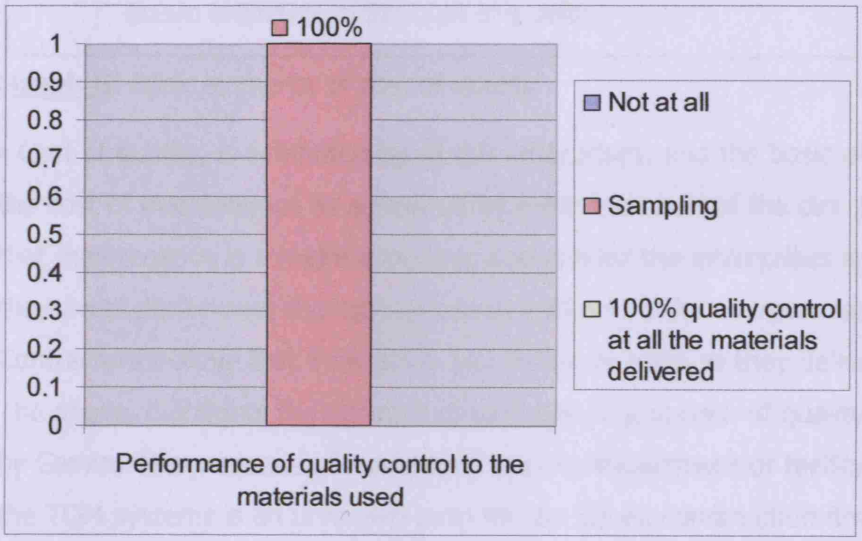
Graph 3: Main weaknesses of the enterprises

On the other hand, the three main weaknesses of the enterprises in order of priority are: lack of capital funds due to domestic economy crisis, to invest on quality, the fact that many site engineers do not perform quality control properly due to lack of knowledge and lack of wide range of construction activities due to limited areas for development. Moreover, it has been stated that some enterprises experience difficulty in acquiring quality materials due to the location and limited supply market. Lastly, some directors admitted that there are times that fail to achieve customer satisfaction. The lack of capital to invest on quality can easily be argued by sacrificing profit in the short term in order to increase quality and possible profit on a longer term. Developers and contractors also have the option of charging a premium on higher quality in certain market segments so that the market is slowly changed. The three main weaknesses of the enterprises are shown in Graph 3.



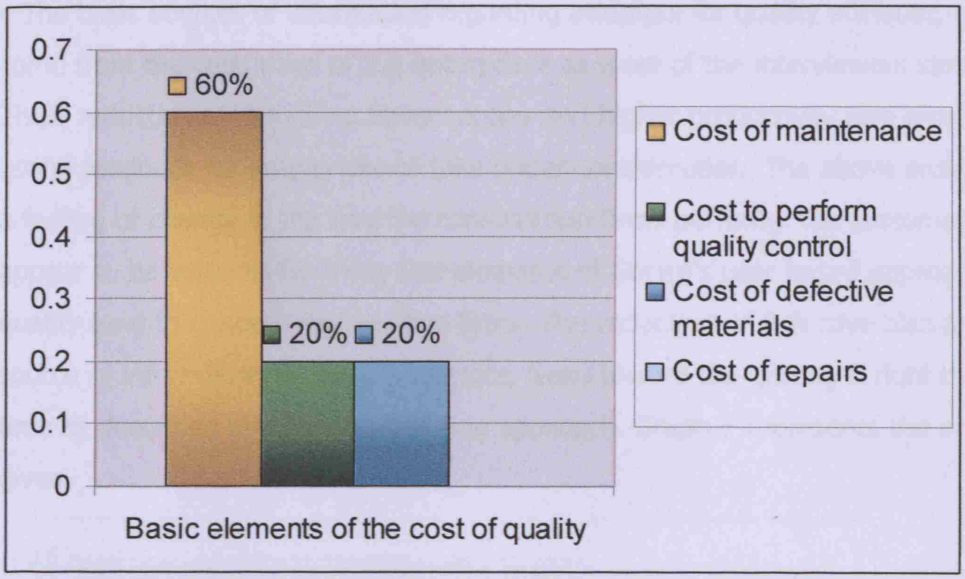
Graph 4: Criteria to select the suppliers of materials

• The criteria that enterprises take under consideration to select the suppliers of materials used during the construction process are in order of priority: price, quality, time of delivery, past dealing, name and reputation. As expected, price is the number one criterion for the enterprises to select a supplier. The answer given unfortunately shows that a total quality management system is not in place for most of the construction firms and the suppliers are chosen on a lowest price concept. The contradiction is obvious since quality material supply is the basis for a quality construction output, which is the aim of most of the contractors as stated in previous question. The total picture of answers given is represented on Graph 4.



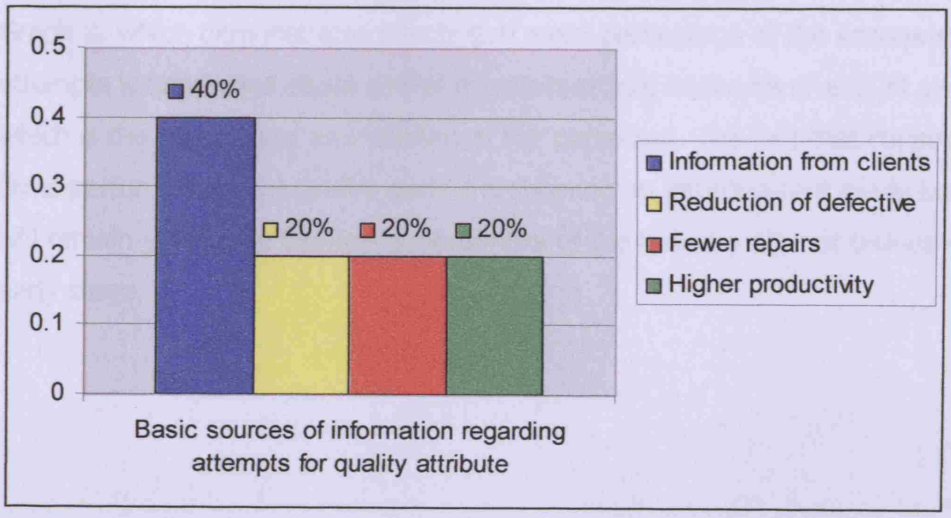
Graph 5: Performance of quality control to the materials used

All of the directors stated that they exert sampling quality control over the materials delivered on site and it takes place during the construction process, as shown detailed in Graph 5. Lastly, the director of qualitative control takes the responsibility for quality control in all enterprises as answered by the interviewers. It appears that some aspects of the total quality management systems are in place, and testing on materials is performed by the construction firms. Sadly, they are partly in place since less than half of the enterprises do not have a manual about quality in their enterprise.



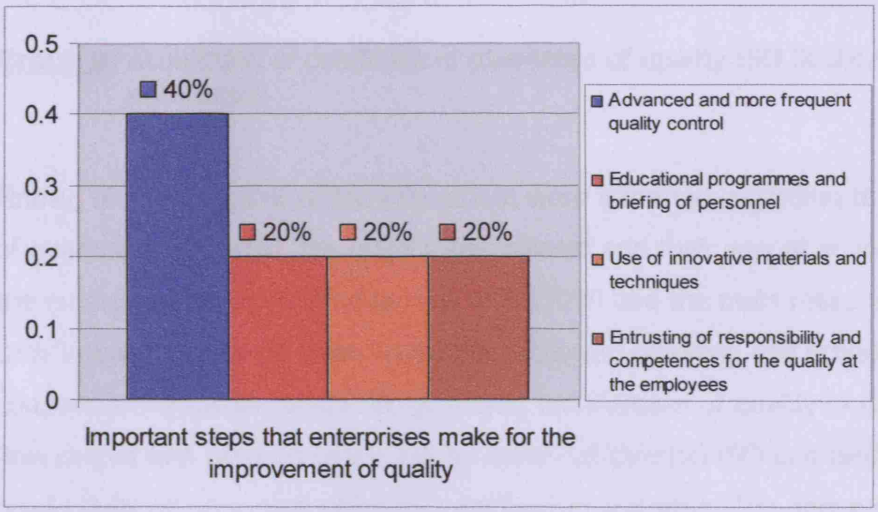
Graph 6: Basic elements of cost of quality

• Cost of quality, is estimated by all the enterprises, and the basic element of it, is the cost of maintenance as answered by more than half of the directors. It appears that maintenance is a major economic concern for the enterprises and it seems that they avoid performing the appropriate activities in order to maximise their profit. Contractors believe that their job is completed as soon as they deliver the product. The above, highlights the absence of user based approach of quality as introduced by Garvin. The presence of a customer service department or facility as required by the TQM systems is an unknown term for the Greek construction firms.
Finally, cost to perform quality control and cost of defective materials is also taken into accountability by construction firms as shown in Graph 6 which represents the total picture of answers given.



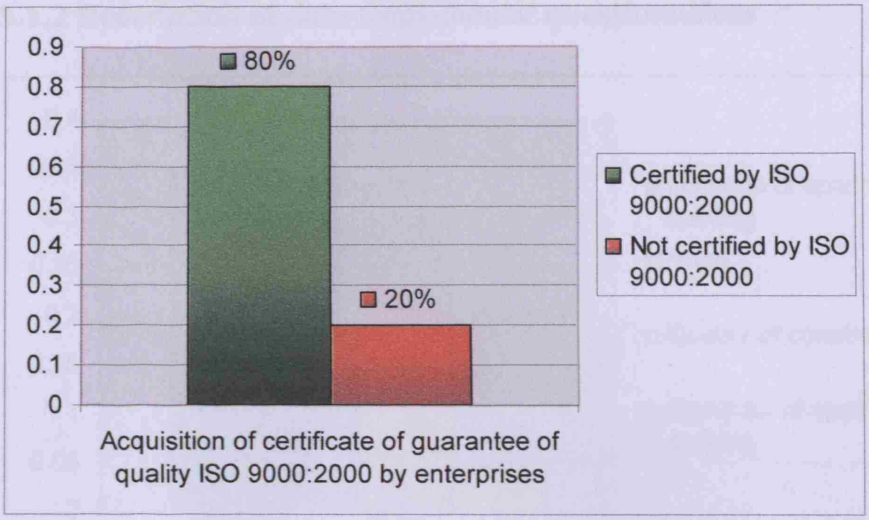
Graph 7: Basic sources of information regarding attempts for quality attribute

• The basic sources of information regarding attempts for quality attribute, mainly come from the customers of the enterprises as most of the interviewers stated. Thus, reduction of defective, fewer repairs and higher productivity also provide a useful feedback for enterprises to take under consideration. The above answers bring a feeling of change in the way the construction firms perform. The customers' views appear to be valuable for them and elements of Garvin's user based approach of quality tend to concern construction firms. The reduction of defective also as a source of information for the contractors, leans toward the getting it right the first time as described in the manufacturing approach. Graph 7 represents the answers given.



Graph 8: Important steps which enterprises make for the improvement of quality

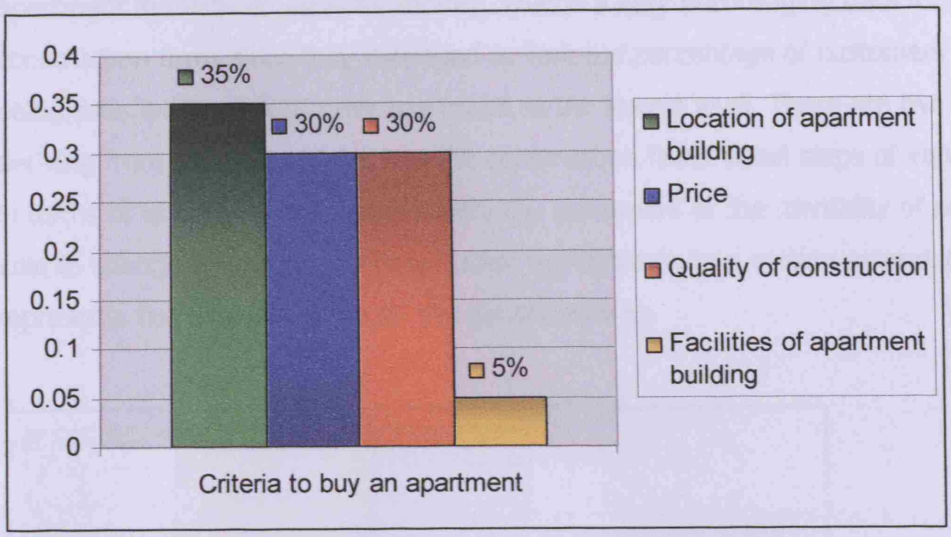
• The crucial step taken by most enterprises for the improvement of quality is the advanced and more frequent quality control. All of the answers are represented by Graph 8, which demonstrates clearly that small percentage of the enterprises' attempts is concerned about one of the most crucial elements of a TQM system, which is the educational and briefing of the personnel. The fact that construction firms perform frequent quality control is showing an improvement made but the pace will remain slow since the new protagonists of the industry are not trained during an early stage.



Graph 9: Acquisition of certificate of guarantee of quality ISO 9000:2000 by the enterprises

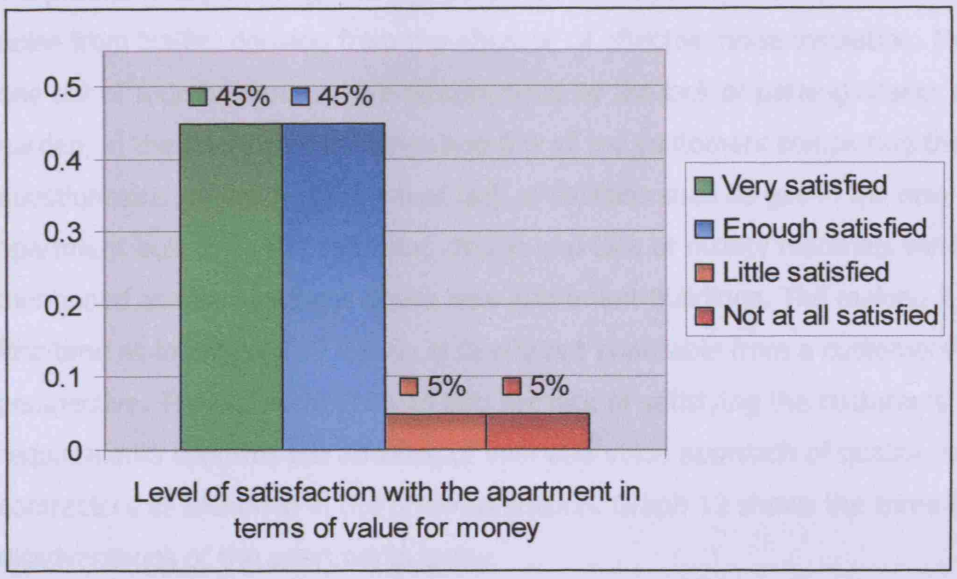
Finally, all the directors of the enterprises were informed regarding to the certificates of guarantee of quality, the advantages offered and their way of acquisition. Most of the enterprises were certified by ISO 9000:2000 and the main reasons for expressing their interest to acquire them were: the advanced planning and scheduling of the construction activities which ISO provides, the increase of quality of the provided final output and services which can be achieved through ISO and lastly the advanced productivity of personnel which ISO application performs. The above data was the most encouraging given by the directors and shows in a small scale, the desire for adding competences within their enterprises.

5.1.2 Description of data from clients' questionnaires



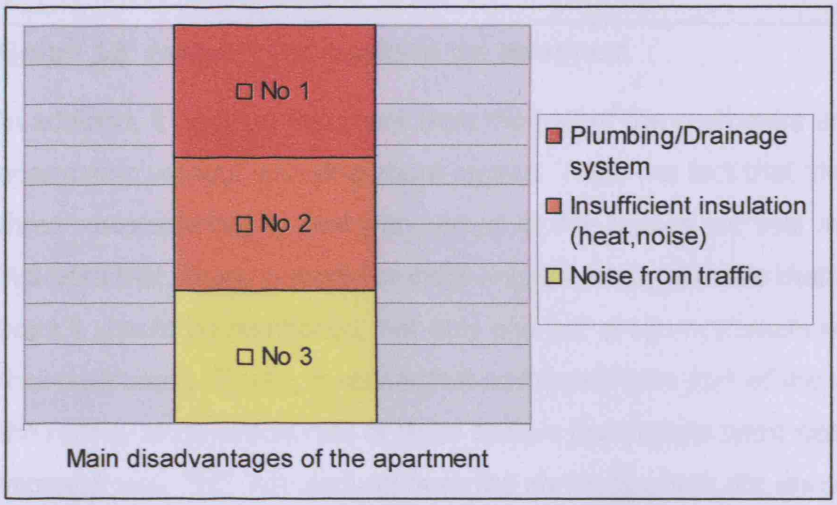
Graph 10: Criteria to buy an apartment

• The main criteria for customers to buy an apartment in order of preference were: the location of the apartment building, price and quality of construction; with the location of the apartment building being their first preference. It can be identified that the customers appear to be part of the problem in the apartment building industry in Greece. Quality of construction is not their first criterion when buying an apartment which makes the picture of the industry more complicated. The above fact explains in a small scale the construction firms' slow pace of improvement on quality. More analytical the criteria are shown on Graph 10.



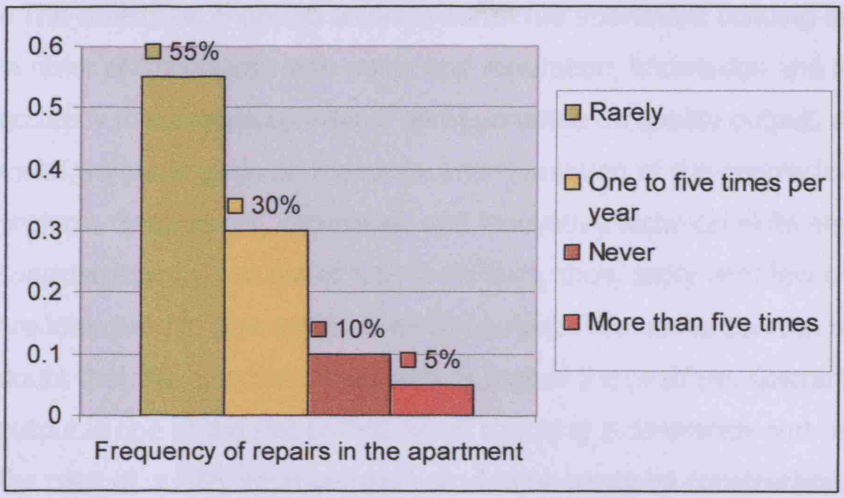
Graph 11: Level of satisfaction with the apartment in terms of value for money

Furthermore, the majority of customers are enough to very satisfied with their apartment in terms of value for money. That is a very encouraging data for the construction firms since they managed to limit the percentage of customers not being satisfied at all with their apartment at the lowest level. There are two scenarios deriving from the above data. It is the construction firms' small steps of improvement in terms of quality efforts, which satisfy the customers or the mentality of not being able to change the picture so they accept the situation to a certain extend. Graph 11 represents the answers given on the questionnaires.



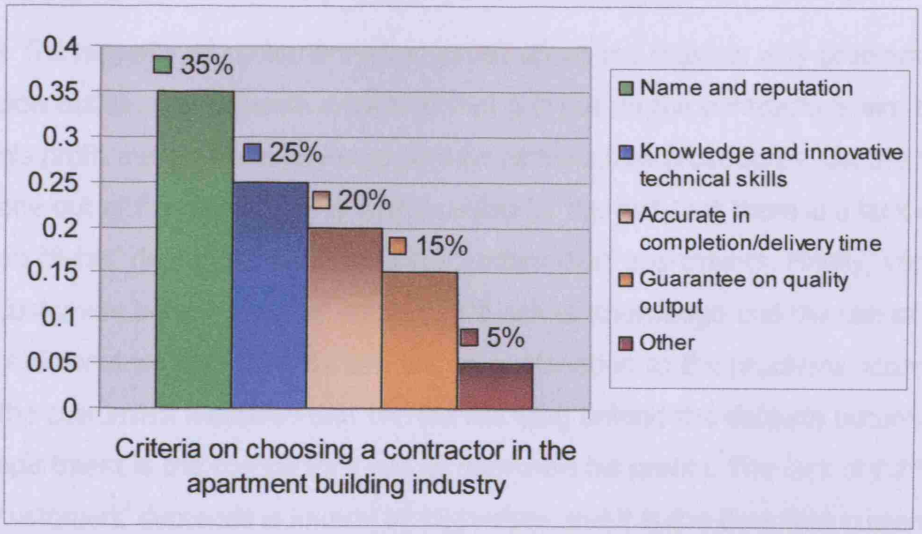
Graph 12: Main disadvantages of the apartment

• The three main disadvantages of new apartments in order of importance are: the problematic plumbing/drainage system, insufficient heat or noise insulation and noise from traffic, deriving from the absence of effective noise insulation. Moreover, one out of four customers were disappointed by the lack of parking spaces and garden, in the apartment buildings and few of the customers completing the questionnaire stated the problem of lack of facilities such as gas in the new apartment buildings. Not satisfying design and lack of quality materials were also mentioned as disadvantages of the new apartment buildings. The making it right the first time as introduced by Garvin is clearly not applicable from a customers' perspective. The technical defaults and the lack of satisfying the customers' requirements confirms the absence of user and value approach of quality by the contractors as identified in the previous section. Graph 12 shows the three main disadvantages of the apartments today.



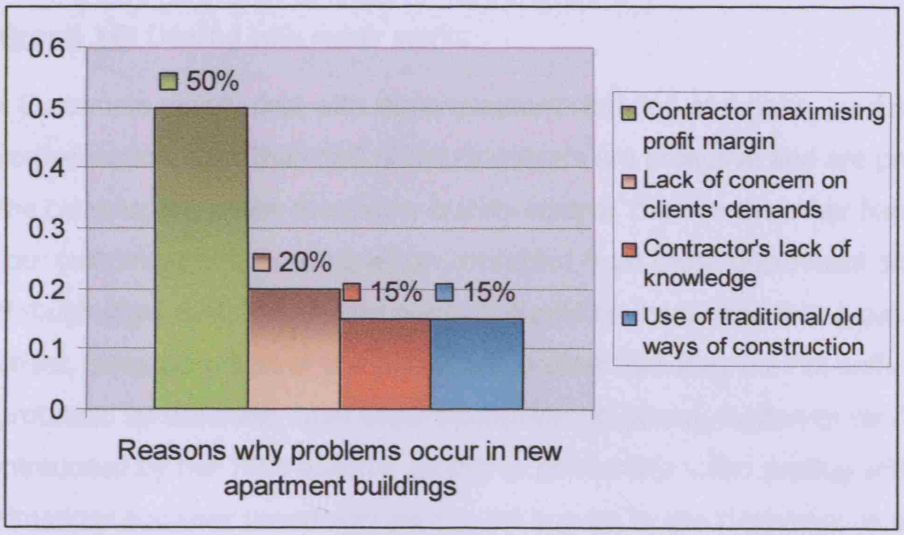
Graph 13: Frequency of repairs in the apartment

In addition, it appears that more than the half of the customers enjoys their apartments without worrying about repairs. Thus, the fact that almost one out of three customers has to deal with one up to five repairs per year in their apartment indicates that, there is room for more improvement, towards that direction. At this point it should be mentioned that only one out of ten customers never had repairs in their apartment. Finally, it seems that customers take part of the responsibility for the repairs since almost half of them believe that repairs were needed due to improper use. The data derived from the above question are encouraging quantity wise. More than half of the customers rarely had repairs in their new apartments which show an achievement made by the construction firms' effort for quality output. The total picture of answers is shown on Graph 13.



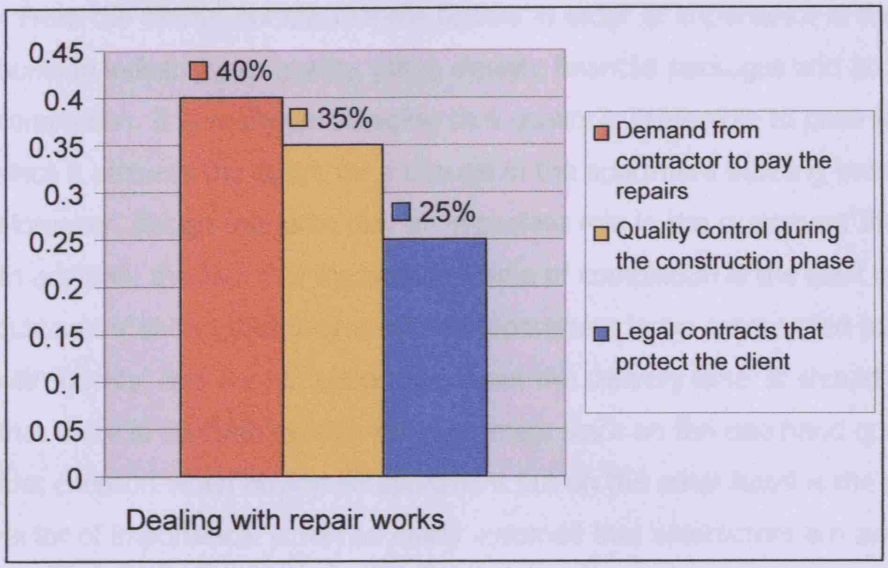
Graph 14: Criteria on choosing a contractor in the apartment building industry

• The criteria on choosing a contractor in the apartment building industry in Greece in order of importance are: name and reputation, knowledge and innovative skills, accuracy in completion/delivery and guarantee on quality output. As expected, too much weight is given on the name and reputation of the contractor and his past projects. Surprisingly, knowledge and innovative technical skills are taken under consideration by one out of four customers, thus, sadly very few of the customers are interested in guarantee on quality output. The above confirm that there is no doubt that the customers' mentality is part of the problem. Guarantee on quality output is one of the last criteria when choosing a contractor and certainly that slows the pace of quality improvements tend to be made by construction firms in the future. The totality of the criteria is shown on Graph 14.



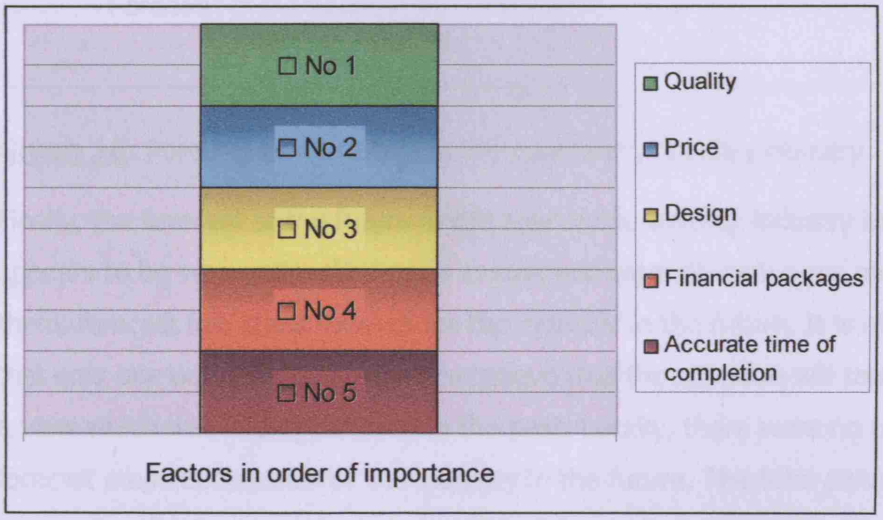
Graph 15: Reasons why problems occur in new apartment buildings

• The majority of customers when asked about the reasons why problems occur in new building apartments answered that it is due to the contractor's aim to maximise his profit margin through inappropriate construction procedures. On the other hand, one out of five customers is disappointed by the fact that there is a lack of concern on clients' demands, which leads to 'problematic' apartments. Finally, very few of the customers believe that the contractor's lack of knowledge and the use of old traditional ways of construction are an explanation to the problems occurred. Half of the customers identified that the reason lying behind the defaults occurring in their apartment is the contractor's aim to maximise his profits. The lack of fulfilling the customers' demands is known by both sides and it is the time that customers should change the picture by realising their vital role in the industry. Graph 15 represents the customers' opinions.



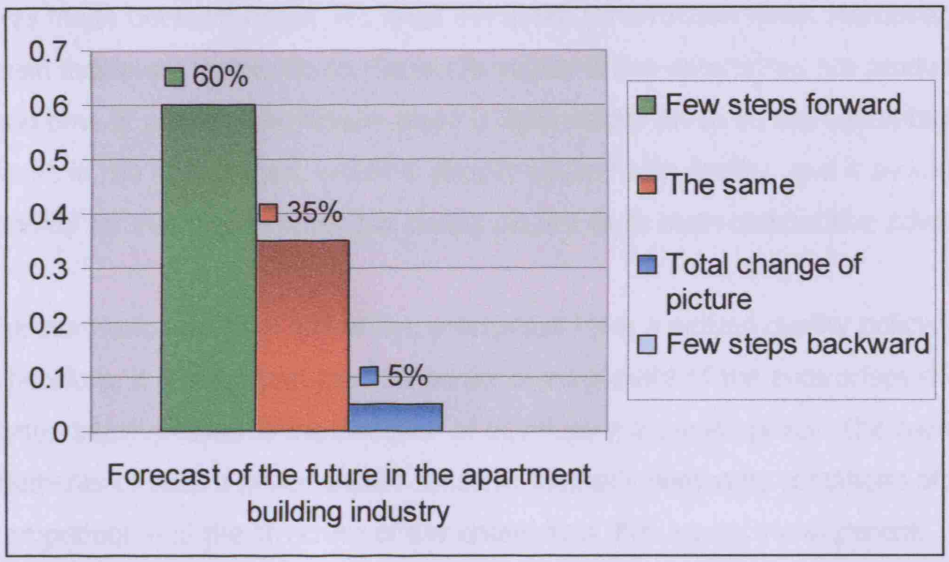
Graph 16: Dealing with repair works

• Customers mainly deal with the unpleasant situation of repairs, by demanding compensation. Less than half of the customers are proactive and are present during the construction phase to monitor quality control, thus on the other hand one out of four customers prefers to be legally protected from those unpleasant situations through legal contracts. At this point, it should be mentioned that a contradiction arises, since almost all of the customers, believe that they are not sufficiently protected by the state, from those intolerable situations. Customer service as introduced by the TQM systems appear to be invisible when dealing with unpleasant situations and user based approach is not applied to the customers as shown in Graph 16 which represents the picture of the customers' views.



Graph 17: Factors in order of importance

• From the clients' perspective the factors in order of importance in the apartment building industry are: quality, price, design, financial packages and accurate time of completion. It is really encouraging that quality is preferable to price for the clients, since it pictures the desire for a change in the apartment building industry in Greece. Moreover, design seems to play an important role in the customers' life too.
In addition, the fact that the accurate time of completion is the least important for customers' shows that they want their apartment to be constructed properly and with quality, and are not concerned about the delivery time. It should be mentioned that there is confusion within the customers since on the one hand quality is not the first criterion when buying an apartment but on the other hand is the number on factor of importance. It can be easily assumed that contractors are aware of the confusion derived from the customers and take advantage of the situation. Graph 17 represents the picture of the customers' views.



Graph 18: Forecast of the future in the apartment building industry

Finally, the forecast of the future in the apartment building industry in Greece appears to be very optimistic from a customers' point of view since more than half of them, forecast few steps forward for the industry in the future. It is also remarkable that only one out of three customers believe that the situation will remain the same, a view which was widely believed in the past. Luckily, there were no customers to forecast steps backwards for the industry in the future. The total picture of answers concerning the future of the apartment building industry is shown on Graph 18.

Chapter 6 Outcomes of research

6.1 Construction firms' perspective

The main outcomes that derive from the analysis of the data provided by the interviews are:
Firstly, it is a fact that there is great confusion at the senior management level of the construction firms regarding quality issues and quality's crucial characteristics in the apartment building industry. Undoubtedly, that has to do with market fragmentation, and different market positions have different strategies for quality. A potential for quality appears to be though the main competitive advantage of the construction firms, as stated at the interviews, but that occurs mainly because of the customers' raising expectations. The comparison is done between domestic rivals only and is based on the loose and continuous fluctuating Greek construction environment. The whole picture would be completely different, if the evaluation and the comparison was made between Greek and West European construction firms. Moreover, the main indicators that evaluate the performance of the enterprises are production cost and time of project completion· there is little weight given on the percentage of faults in the final project, which is directly related with quality, and it should be a priority for every enterprise that claims quality as its main competitive advantage.

Furthermore, less than half of the enterprises have a written quality policy. Therefore, it is important that the senior management of the enterprises should work systematically towards the direction of developing a quality policy. The basic elements of such a policy should concern: market's demands, conditions of competition and the structure of the enterprises. Full senior management commitment and involvement towards that direction is essential, since those activities are considered as a crucial factor for success as well as the educational programmes and briefing of personnel.

In addition, the performance of the construction firms regarding the basic characteristics of a quality control system can be described as moderate to low. More analytical, there is lack of training of personnel on issues in control of quality, there is absence of proper quality control on site by site engineers and price is the main criterion that determines the selection of the suppliers of materials used on

apartment buildings. The only positive data presented, is the fact that personnel from all levels, can make proposals for the improvement of quality.

Moreover, governmental regulations are a major factor that influences the activities of the construction enterprises. This factor should be taken under consideration from the construction firms as well as from the public authorities, in order to create a cooperating environment that will lead to a desirable strategic planning for the apartment building industry. It is a fact worldwide that a proper strategic planning can provide major economical and social advantages.

Nevertheless, the construction firms' information regarding the certificates of guarantee of quality, such as ISO 9000:2000 is going to the right direction; that is partly to the fact that there is experience based from the use of those systems in manufacturing, but also from the fact that clients start demanding quality assurance certificates. In particular, the acquisition and use of a certificate of guarantee of quality is considered as a tool to improve the quality of the final output and the whole construction process. Negative elements regarding the enterprises' preparation to use and embed the certificates, are the lack of certain policy concerning quality and the limited use of manuals about quality.

It is more than obvious that steps forward have been made in the Greek apartment building industry over the last years. The problematic housing production system of Antiparohi is almost completely left in the past, and elements of the five approaches of quality are introduced in the industry. User based quality is applied through the contractor's concern of satisfying the customers' needs and expectations, while quality system standards of ISO 9000 are becoming an essential tool for every construction firm, revealing the contractors' will to apply manufacturing based quality elements. The mentality of getting it right from the beginning is enhancing to the construction firms' way of performing and yet there are more to come.

To sum up, as a general outcome it can be mentioned that the obstacles for introducing and applying the principles of quality guarantee are important, but they can be overcome by the boards' willing to achieve a competitive advantage into the apartment building industry in Greece.

6.2 Customers' perspective

The main outcomes that derive from the analysis of the data provided by the interviews are:
Firstly, it is a fact that the majority of customers choose a contractor by the name and reputation. Social relationships appear to be very important in the Greek society when choosing a contractor even if basic elements of TQM systems such as customer service are not in place.

Moreover, the target of zero defects is certainly not achieved within the Greek apartment building industry, and dysfunctional services are the primary problem of the apartments, as identified by the customers. The majority of the customers are used to such unpleasant situations, and demand from the contractor to pay for the repairs needed. Half of the customers are still suspicious towards the contractor behaviour, and believe that the main reason laying behind the defects is the contractor's aim to maximise his profit margin.

Additionally, it is important to mention that most of the customers do not experience serious defects in their new apartments and are generally satisfied with the final product.

Finally, customers seem to foresee the change made by the industry over the last years, and appear to be optimistic for the future. More than half of the customers forecast few steps forward are going to be made in the future. The above data shows that the effort made by the contractors to improve quality of construction provides the first signs of recognition.

The challenge is ongoing for the contractors in Greece, and they seem to slightly change the picture of the apartment building industry, but yet there is still far more room for improvement to be made on the quality aspects.

Chapter 7 – Recommendations

7.1 General Recommendations

There are many areas which need immediate improvement in the present picture of the Greek apartment building industry. It is essential that the Greek Building Industry should follow the successful example of the British and West European Building Industry.

7.2 Recommendations for the construction firms

The purpose of the recommendations for the construction firms is to identify and summarise points that should be of major interest and concern to the top management of companies operating in the apartment building industry.

Customer care is a key topic, particularly for the companies with close contact with the users of buildings, either at the purchase stage or on a continuous operational/maintenance basis. Among the initiatives adopted to improve customer care are customer-care charters, codes of practice and similar schemes covering the work of suppliers and subcontractors.

The shortage of skilled labour continues to be a challenge to the Greek construction industry. There is likely to be an increase in the use of casual labour from the pool of immigrants now established in Greece. In an effort to reduce construction costs, les ethically and responsible companies (usually small local firms) are reported to be hiring illegal immigrants on a day-to-day basis, with no proper terms of employment, insurance. Construction companies should be conscious of the need to have a responsible, competent workforce with a range of career prospects. Modern Apprenticeships and other training schemes should be implemented to deal with the industry-wide shortage of skilled labour.

Furthermore, knowledge should be seen as a valuable resource. Knowledge management and organisational learning should be a competence of any construction firm operating in the apartment building industry. It is crucial to avoid reinventing the wheel and phrases such as 'We have always done it that way' should not appear in the way a modern construction firm operates. Elements of all Garvin's approaches of quality should be adapted by the construction firms.

In addition, managers and experts inspections' on site, should be continuous and as often as possible. It is essential that people in these positions provide the experience and knowledge to junior staff. Further motives for quality work should be given to employees, through a revising reward system.

Moreover, employees should be used more effectively, and should be taught to avoid the blame culture, while encouraging a culture change, through teamwork. It is also important that, improvement is made in the supply chain management area. Material suppliers should be evaluated under strict quality and reliability criteria. The operational workforce should be regular trained in order to fully understand the quality process and increase the use of manuals and incoming material control.

Finally, the most important area that needs extra attention is the behaviour towards the customer. It is crucial that construction firms realise that satisfying the customer is the most important competitive goal as identified within Garvin's user based approach of quality. In order to achieve that, the customer's needs should be identified at the earliest stage. Construction firms should focus on the customer and learn from him while providing innovative solutions and proposals. They should listen, understand and respond to the customers' needs.

7.3 Recommendations for the customers

The customers should realize the importance of their role. A change in the customers' behaviour and needs is always followed by a change in the way the apartment building industry performs.

Firstly, I would recommend to the customers to have some technical knowledge relative to the industry. This factor will help the communication with the contractor and provide to the customer an inside view of the industry. Furthermore, the customer should make his needs clear from the pre-design stage and not during construction. Time is one of the most important factors for the industry and everything needs to be planned in advance. Unfortunately, one of the most common problems in the industry is the fact that customers' complaints come in too late and that should be eliminated in the future. In addition, I would recommend the customers to be reliable and share a relationship of trust with the contractor, since they both work to achieve the same goal.

The customers should pressure towards a new era for the industry a demand elements of user based approach of quality, customer service and after sales departments to be in place in the construction firm they employ.

7.4 Recommendations for further research

It is a fact that, quality issues in the construction industry are covering a huge area for further research and development in the future. In relation to this report, I would recommend the importance of researching the role that particular tools and techniques play. A number of quality management and quality control systems are available, but the extensive role and the wide applicability they have, is an area that needs further research. Questions such as 'Who needs to be educated?', 'What competencies are required?', 'What are the expected benefits?' and 'Who will undertake the actual education/training?' should be reliably answered.
Also, DQI appears to be the tool of the future for all parties involved in the industry. Its simplicity and the variety of applications under development need to be further researched. It is vital that we ensure that people make the best use of tools and techniques, in order to improve the quality and the picture of the apartment building industry.

8. Conclusions

The building apartment industry has been a dysfunctional division of the construction industry during the last years in Greece. Many factors were responsible for the poor picture, mainly lying behind contractors' maximising their profit, problematic construction production systems and absence of clients' interference.
It is a fact that after the successful implementation of the Olympic Games challenge in 2004, many steps of improvement were made with quality in construction being the main protagonist.
Following the changing era that appeared in the Greek construction industry, I had the opportunity to research if the change was also implicated in the apartment building industry and capture the existing picture. After reviewing the relevant literature, field research was performed through interviews with construction firms' representatives and questionnaires to customers.
The outcome derived was an improved building environment confirmed by the customers but elements of the old traditional construction still being in place.
Through this thesis, data were analysed after description, and methods and systems were proposed to improve the apartment building environment. It is agreed that quality is a term that covers a wide range of activities especially in construction and several tools and procedures are needed to monitor and apply it but more importantly, determination for change is needed from both the construction firms and clients to achieve a better value.

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Appendix

Questionnaire for Construction Firms

CONSTRUCTION FIRM DATA

NAME:

ADDRESS:

TELEPHONE NUMBER:

FAX:

MAIN ACTIVITIES:

TOTAL NUMBER OF EMPLOYEES:

PRESIDENT – CHAIRMAN:

DIRECTOR OF QUALITATIVE CONTROL:

DATA OF PERSON BEING INTERVIEWED

SURNAME:

FIRST NAME:

SPECIALITY:

POSITION IN THE ENTERPRISE:

TELEPHONE:

E-MAIL:

QUESTIONS FOR THE INTERVIEWS

1) Which are the indicators that evaluate the performance of your enterprise?

- ☐ Production cost
- ☐ Time of project completion
- ☐ Percentage of faults in the final project
- ☐ Other (Please specify):

2) How competitive is the sector in which you belong?

- ☐ Number of companies (General)
- ☐ Location of competitors (Specific)
- ☐ Trade of location oligopoly vs. quality issues

3) In your opinion which are the mainly competitive advantages of your enterprise? (Rank the top three)

- ☐ Quality output
- ☐ Price
- ☐ Reliability
- ☐ Guarantee
- ☐ Other:

4) Which are the three main weaknesses of your enterprise?

i)

ii)

iii)

5) How much do governmental regulations influence the activities of your enterprise?

- ☐ Not at all
- ☐ Little
- ☐ Enough
- ☐ Too much

6) How does your company addresses quality issues?

7) To what extend do you train your personnel on issues in control of quality?

8) To what extend do you get proposals from the personnel or the executives of enterprise for the improvement of quality?

9) How does ISO 9000 affect your business?

10) What kind of costs and benefits do you think that ISO 9000 provides to your enterprise? Is it worth it? In what ways do you benefit?

11) Which are the criteria that you select the suppliers of materials that you use in your activities? Put in priority of importance the following criteria:

- ☐ Quality
- ☐ Price
- ☐ Name and reputation
- ☐ Time of delivery
- ☐ Past dealing
- ☐ Other

12) What are the most critical issues concerning quality technically and from the customers perspective?

13) Do you perform quality control to the products/materials that you use?

- ☐ Not at all
- ☐ Sampling
- ☐ 100%

14) Which are your sources of information concerning to the customers demands?

15) When do you perform quality control?

- ☐ During the construction process
- ☐ After the completion of the project
- ☐ Other:

16) Do you measure/estimate the cost of quality?

- ☐ Yes
- ☐ No

17) Which do you think are the basic elements of the cost of quality?

- ☐ Cost to perform quality control
- ☐ Cost of defective materials
- ☐ Cost of repairs
- ☐ Cost of maintenance
- ☐ Other:

18) Who takes responsibility for quality control in your enterprise?

19) Is there a manual about quality in your enterprise?

- ☐ Yes
- ☐ No

20) How do you know when and if your attempts regarding quality attribute?

- ☐ Information from clients
- ☐ Higher productivity
- ☐ Increase of profit margin
- ☐ Reduction of defective
- ☐ Fewer repairs
- ☐ Other

21) Which from the following steps is the most important that your enterprise made for the improvement of quality?

- ☐ Educational programs and briefing of personnel
- ☐ Entrusting of responsibility and competences for the quality at the employees
- ☐ Modernisation of equipment
- ☐ Advanced and more frequent quality control
- ☐ Use of innovative materials and techniques
- ☐ Other

22) Is your enterprise informed regarding to the certificates of guarantee of quality, their way of acquisition and the advantages that they offer?

23) Have you expressed interest for the acquisition of certificate of guarantee of quality (e.g. ISO9000:2000)? If yes, what was the reason for expressing interest?

Appendix

Questionnaire for Customers

DATA OF PERSON ANSWERING THE QUESTIONNAIRE

Surname:

First name:

Address:

Telephone:

E-mail:

Occupation:

Age:

Year of apartment purchase:

QUESTIONNAIRE

1) Under what criteria did you buy the apartment?

- ☐ Price
- ☐ Quality of construction
- ☐ Location of apartment building
- ☐ Facilities of apartment building
- ☐ Other (Please specify)

2) How satisfied are you with the apartment in terms of value for money?

- ☐ Not at all
- ☐ Little
- ☐ Enough
- ☐ Very

3) Which are the three main disadvantages of the apartment?

i)

ii)

iii)

4) How often did you have repairs in your apartment?

- ☐ Never
- ☐ Rarely
- ☐ One to five times per year
- ☐ More than five times per year

5) Why do you think repairs were needed at your apartment?

- ☐ Poor quality construction
- ☐ Wrong use
- ☐ Other (Please specify):

6) Which were the criteria on choosing a contractor or construction firm in the apartment building industry?

- ☐ Name and reputation
- ☐ Guarantee on quality output
- ☐ Knowledge and innovative technical skills
- ☐ Accurate in completion/delivery time
- ☐ Other (Please specify)

7) Why do you think problems occur in new apartment buildings?

- ☐ Contractor maximising profit margin
- ☐ Contractor's lack of knowledge
- ☐ Lack of concern on clients' demands
- ☐ Use of traditional/old ways of construction
- ☐ Other (Please specify)

8) At what extend is the client legally protected from those unacceptable situations by the state?

- ☐ Not at all
- ☐ Little protected
- ☐ A lot
- ☐ Fully

9) How do you forecast the future in the apartment building industry?

- ☐ Few steps backward
- ☐ The same
- ☐ Few steps forward
- ☐ Total change of picture

10) How do you deal with those unpleasant situations?

- ☐ Quality control during the construction phase
- ☐ Legal contracts that protect the client
- ☐ Demand from contractor to pay the repairs
- ☐ Other (Please specify)

11) Prioritise the following factors in order of importance.

- ☐ Price (Total amount)
- ☐ Financial packages
- ☐ Design
- ☐ Quality
- ☐ Accurate time of completion